Plan Overview

A Data Management Plan created using DMPTool

Title: City of Phoenix Passive Detection Technology for Bikes, Pedestrians and Motorists

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Template: SMART Grants Stage 1 Data Management Plan (DMP)

Project abstract:

There are two components to the proposed project. The first component is passive detection for bikes and pedestrians along the Grand Canal. This component includes installation of passive pedestrian, bicycle, and motorist detection technology at 10 locations on a portion of the Grand Canal. Each of these locations currently have high intensity activated crosswalks (HAWKs) installed that will be upgraded to include passive detection. The second component in partnership with Maricopa Association of Governments (MAG) and business partner NoTraffic is to install advanced video detection cameras at 20 intersections that will collect traffic videos that will run appropriate algorithms, extract traffic counts, and send the data to NoTraffic's cloud-based software.

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City of Phoenix Passive Detection Technology for Bikes, Pedestrians and Motorists

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1. The City of Phoenix is planning to install advanced video detection cameras at 20 intersections to collect traffic videos. The software will run appropriate algorithms, extract traffic counts, and push all data to NoTraffic's cloud-based software. The software will optimize traffic signal operations and provide detailed traffic signal performance measures, such as red-light running events, speed data, and real-time alerts.

2. Data in each of the six (6) categories can be described using a 0 - 4 category system modeled after the NASA Earth Observing System Data and Information System (EOSDIS)(1) where level 0 data is raw data that has not been processed or data that should not be shared and includes captured video that will be used for verification and validation. Level 0 data may require considerations for privacy and security. Level 1 is data that has had some level of processing but may contain information that should only be used by the system integration team for system testing purposes such as detailed trajectories of VRUs. Level 2 data is data that has been aggregated and may be useful for describing the operation of the system such as average vehicle delay, stops, etc. and number of VRUs detected by category (pedestrians, bicycles, other). Level 3 data includes periodic summary data such as the number of VRU's detected at each location per hour, etc. and traffic performance measures. Level 4 data is model data that has been derived from other data for the purposes of characterizing system performance or assessing impact of the City of Phoenix SMART Grant demonstration to support the decision to move to city-wide deployment.

Data from the infrastructure applications, such as traffic signal system data, will be classified based on its availability publicly (level 3) or not (level 0 of 1) and application data, such as PSM broadcast over the 5.9GHz spectrum or sent to smartphones will be classified as level 3. Data from warnings sent to C-V2X equipped vehicles or individual smartphones will not contain any participant identification information.

The goal of the project is to demonstrate (as part of the planning process) that these video based sensor systems can have significant impact on safety, mobility, and the environment when deployed across the entire city of Phoenix. The planning deployment locations were selected to address critical needs as well as to engage with diverse communities. The data (level 3 and level 4) will be used to characterize the operations and impact of the system.

https://www.earthdata.nasa.gov/engage/open-data-services-and-software/data-information-policy/data-levels

3. The locations of the HAWK and traffic signals is well known public data. Data about the infrastructure technology, e.g., the video detection systems used for intelligent traffic control and detection of vulnerable road users, is part of the city of Phoenix ATMS and controlled by the partners (NoTraffic and Iteris). Each of these organizations provides cybersecurity systems to protect the data from being accessed. The 5.9GHz wireless communications system is secured as part of the city of Phoenix ATMS system and the messages are signed using the MCDOT provides SCMS system (supported for the region). Messages communicated over cellular systems, such as Verizon, are protected by the cellular providers security systems. No PII data will be communicated in this

project.

This section of the plan will be updated as details become available.

4. Over the long term, the data generated and archived from this project will support planning decisions for the broad implementation throughout the city of Phoenix. In a fully operational system beyond the pilot, there will not be a need to archive much of the level 0 and level 1 data unless there is a justified case for further analysis. It is anticipated that safety, mobility, and environmental impacts will be significantly improved and the case for further deployments will be supported by the data.

Data that is to be archived will be collected in the cloud systems used by NoTraffic and Iteris and in the city of Phoenix ATMS in either standard video format (e.g., mpeg,) or in CSV format periodically (e.g., hourly or daily). As analysis methods are developed, the data may be transferred into other formats that support efficient searching and processing such as Apache Parquet (https://www.databricks.com/glossary/what-is-parquet), .db, or possibly STAC (SpatioTemporal Asset Catalogs).

A metadata plan will be developed using the DCAT-US format and will be stored with the data city of Phoenix ATMS and in the partner systems. The meta data will describe all data elements that are part of the city of Phoenix SMART Grant advanced technology deployments.

Access to the data will be based on Data Use Agreements (see section 5 below) and the 0-4 levels established for each type of data.

Different data belongs to different project partners and a Data Use Agreement will be developed between partners based on the 0-4 level system described above and the intended use. For example, traffic signal phase and timing data, detected vehicle and vulnerable road user data belongs to the city of Phoenix. PSM data that is generated from the vulnerable road user sensors will also belong to the city of Phoenix. Use of the data by others will require development of a data use agreement that describes the intended use and procedures for ensuring safety and security. These data agreements will be developed on an as needed basis.

The team will explore a plan to use the city of Phoenix ATMS for data archiving and preservation. Similarly, NoTraffic and Iteris will develop agreements with the city of Phoenix for data archiving and preservation that cover the time periods required.

A special data repository will be considered for the city of Phoenix SMART Grant project that will include data from all six (6) categories. The details of the data repository will be determined in collaboration with the project partners and this section of the plan will be updated accordingly.

A metadata plan will be developed using the DCAT-US format.